

IN THE CLAIMS

The following listing of the claims and their current status is provided in accordance with 37 C.F.R. §1.121.

1. (currently amended) A method for imaging an organ, comprising the steps of:
acquiring a set of motion data for one or more organs using one or more sensors;
validating the set of motion data using another set of motion data derived from a dataset acquired using an imager;
processing the set of motion data to extract two or more prospective gating points for an organ of interest; [[and]]
acquiring a set of image data representative of the organ of interest using the two or more prospective gating points using the imager;
reconstructing the set of image data to generate a set of reconstructed data; and
generating an image from the set of reconstructed data, wherein generating the image comprises fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.
- 2-3. (canceled)
4. (previously presented) The method, as recited in claim 1, wherein at least one of the one or more sensors is activated in accordance with a set of positional data acquired by one or more positional sensors.
5. (previously presented) The method, as recited in claim 1, wherein the one or more sensors comprise two or more electrical sensors of the same type.
6. (previously presented) The method, as recited in claim 1, wherein the one or more sensors comprise at least one type of non-electrical sensor.

7. (original) The method, as recited in claim 1, wherein the set of motion data is at least partially acquired from a set of pre-acquisition image data.
8. (currently amended) A method, for imaging an organ, comprising the steps of:
acquiring a set of motion data for one or more organs using at least one electrical sensor and at least one non-electrical sensor;
processing the set of motion data to extract two or more prospective gating points for an organ of interest and to extract one or more motion compensation factors; [[and]]
acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;
reconstructing the set of image data to generate a set of reconstructed data; and
generating an image from the set of reconstructed data, wherein generating the image comprises fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.
- 9-10. (canceled)
11. (previously presented) The method, as recited in claim 8, wherein at least one of the electrical or non-electrical sensors is activated in accordance with a set of positional data acquired by one or more positional sensors.
12. (previously presented) The method, as recited in claim 8, wherein the at least one electrical sensor comprises two or more electrical sensors of the same type.
13. (previously presented) The method, as recited in claim 8, wherein the at least one non-electrical sensor comprises one or more types of non-electrical sensors.

14. (original) The method, as recited in claim 8, wherein the set of motion data is at least partially acquired from a set of pre-acquisition image data.

15. (currently amended) One or more computer readable storage media having executable code stored thereon for imaging an organ, the executable code comprising:

a routine for acquiring a set of motion data for one or more organs using one or more sensors;

a routine for validating the set of motion data using another set of motion data derived from a dataset acquired using an imager;

a routine for processing the set of motion data to extract two or more prospective gating points for an organ of interest; [[and]]

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points using the imager;

a routine for reconstructing the set of image data to generate a set of reconstructed data; and

a routine for generating an image from the set of reconstructed data, wherein the routine for generating the image fuses a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

16-17. (canceled)

18. (previously presented) The one or more computer readable storage media, as recited in claim 15, wherein the routine for acquiring the set of motion data activates at least one of the one or more sensors in accordance with a set of positional data acquired by one or more positional sensors.

19. (previously presented) The one or more computer readable storage media, as recited in claim 15, wherein the routine for acquiring the set of motion data acquires at least part of the set of motion data from a set of pre-acquisition image data.

20. (currently amended) One or more computer readable storage media having executable code stored thereon for imaging an organ, the executable code comprising:

- a routine for acquiring a set of motion data for one or more organs using at least one electrical sensor and at least one non-electrical sensor;
- a routine for processing the set of motion data to extract two or more prospective gating points for an organ of interest and to extract one or more motion compensation factors; [[and]]
- a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;
- a routine for reconstructing the set of image data to generate a set of reconstructed data; and
- a routine for generating an image from the set of reconstructed data, wherein the routine for generating the image fuses a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

21-22. (canceled)

23. (previously presented) The one or more computer readable storage media, as recited in claim 20, wherein the routine for acquiring the set of motion data activates at least one of the electrical or non-electrical sensors in accordance with a set of positional data acquired by one or more positional sensors.

24. (previously presented) The one or more computer readable storage media, as recited in claim 20, wherein the routine for acquiring the set of motion data acquires at least part of the set of motion data from a set of pre-acquisition image data.

25. (currently amended) An imaging system comprising:
an imager configured to generate a plurality of signals representative of a region of interest;
data acquisition circuitry configured to acquire the plurality of signals;
data processing circuitry configured to process the plurality of signals;
system control circuitry configured to operate at least one of the imager and the data acquisition circuitry;
an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
and
a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of two or more organs within the region of interest using one or more sensors to obtain a set of motion data, wherein the one or more sensors comprises one or more non-electrical sensors, and wherein the imaging system comprises one or more positional sensors configured to activate the one or more non-electrical sensors based on the position of the one or more non-electrical sensors relative to the imager;
wherein the data processing circuitry is further configured to validate the set of motion data using another set of motion data derived from a dataset acquired by the imager.

26. (canceled)

27. (currently amended) ~~The imaging system as recited in claim 25;~~ An imaging system comprising:
an imager configured to generate a plurality of signals representative of a region of interest;
data acquisition circuitry configured to acquire the plurality of signals;
data processing circuitry configured to process the plurality of signals;
system control circuitry configured to operate at least one of the imager and the data acquisition circuitry;
an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
and
a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of two or more organs within the region of interest using one or more sensors to obtain a set of motion data, wherein the one or more sensors comprises two or more electrical sensors, and wherein the imaging system comprises one or more positional sensors configured to activate the two or more electrical sensors based on the position of the two or more electrical sensors relative to the imager;
wherein the data processing circuitry is further configured to validate the set of motion data using another set of motion data derived from a dataset acquired by the imager.
28. (previously presented) The imaging system as recited in claim 25, wherein the one or more sensors comprises two or more electrical sensors, and wherein the sensor-based motion measurement system is configured to measure electrical activity indicative of the motion of the two or more organs via the two or more electrical sensors.
29. (previously presented) The imaging system as recited in claim 25, wherein the one or more sensors comprises one or more non-electrical sensors, and wherein the sensor-based motion measurement system is configured to measure non-electrical activity indicative of the motion of the two or more organs via the one or more non-electrical sensors.

30. (original) The imaging system as recited in claim 29, wherein the one or more non-electrical sensors comprise accelerometers, optical markers, displacement sensors, force sensors, ultrasonic sensors, strain gauges, photodiodes, and pressure sensors.

31. (currently amended) An imaging system comprising:
an imager configured to generate a plurality of signals representative of a set of image data corresponding to a region of interest;
data acquisition circuitry configured to acquire the plurality of signals;
data processing circuitry configured to process the plurality of signals;
system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based at least partially upon one or more motion compensation factors derived from a set of motion data describing the motion of two or more organs within a region of interest;
an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
and
two or more sensor-based motion measurement systems that contribute to the set of motion data, wherein the two or more sensor-based motion measurement systems include an electrical sensor-based motion measurement system configured to measure electrical activity indicative of the motion of the two or more organs and a non-electrical sensor-based motion measurement system configured to measure non-electrical activity indicative of the motion of the two or more organs;
wherein the data processing circuitry is configured to reconstruct the set of image data to generate a set of reconstructed data and generate an image from the set of reconstructed data by fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

32. (previously presented) The imaging system as recited in claim 31, further comprising one or more positional sensors configured to activate one or more non-electrical sensors of the non-electrical sensor-based motion measurement system based on the position of one or more non-electrical sensors relative to the imager.

33. (previously presented) The imaging system as recited in claim 31, further comprising one or more positional sensors configured to activate two or more electrical sensors of electrical sensor-based motion measurement system based on the position of two or more electrical sensors relative to the imager.

34. (previously presented) The imaging system as recited in claim 31, wherein the electrical sensor-based motion measurement system is configured to measure electrical activity indicative of the motion of the two or more organs via two or more electrical sensors.

35. (previously presented) The imaging system as recited in claim 31, wherein the non-electrical sensor-based motion measurement system is configured to measure non-electrical activity indicative of the motion of the two or more organs via one or more non-electrical sensors.

36. (original) The imaging system as recited in claim 35, wherein the one or more non-electrical sensors comprise accelerometers, optical markers, displacement sensors, force sensors, ultrasonic sensors, strain gauges, photodiodes, and pressure sensors.

37. (canceled)

38. (canceled)

39. (previously presented) An imaging system comprising:
- an imager configured to generate a plurality of signals representative of a set of image data corresponding to a region of interest;
 - data acquisition circuitry configured to acquire the plurality of signals;
 - data processing circuitry configured to process the plurality of signals;
 - system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from a set of motion data describing the motion of two or more organs within the region of interest;
 - an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
 - and
 - a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of at least one of the two or more organs within the region of interest using one or more sensors to contribute to the set of motion data;
 - wherein the data processing circuitry is further configured to validate the set of motion data using another set of motion data derived from a dataset acquired by the imager, reconstruct the set of image data to generate a set of reconstructed data, and generate an image from the set of reconstructed data by fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

40. (previously presented) An imaging system comprising:
- an imager configured to generate a plurality of signals representative of a set of image data corresponding to a region of interest;
 - data acquisition circuitry configured to acquire the plurality of signals;
 - data processing circuitry configured to process the plurality of signals;
 - system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points and one or more

motion compensation factors derived from a set of motion data describing the motion of two or more organs within a region of interest;

~~derived from a set of motion data describing the motion of at least one organ within the region of interest;~~

an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to contribute to the set of motion data by measuring electrical or non-electrical activity indicative of the motion of the at least one organ within the region of interest using at least one electrical sensor and at least one non-electrical sensor;

wherein the data processing circuitry is configured to reconstruct the set of image data to generate a set of reconstructed data and generate an image from the set of reconstructed data by fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

41. (new) The imaging system as recited in claim 27, wherein the one or more sensors comprises two or more electrical sensors, and wherein the sensor-based motion measurement system is configured to measure electrical activity indicative of the motion of the two or more organs via the two or more electrical sensors.

42. (new) The imaging system as recited in claim 27, wherein the one or more sensors comprises one or more non-electrical sensors, and wherein the sensor-based motion measurement system is configured to measure non-electrical activity indicative of the motion of the two or more organs via the one or more non-electrical sensors.

43. (new) The imaging system as recited in claim 42, wherein the one or more non-electrical sensors comprise accelerometers, optical markers, displacement sensors, force sensors, ultrasonic sensors, strain gauges, photodiodes, and pressure sensors.